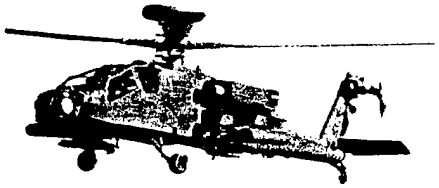
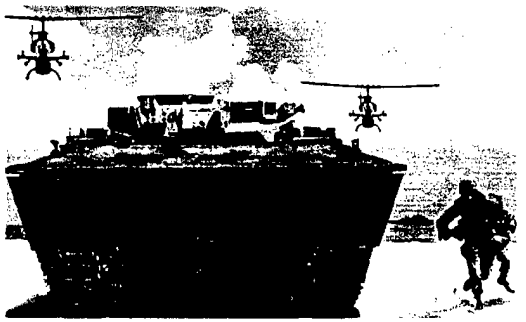
TACOM - ARDEC
Picatinny Arsenal



U.S. Army Medium Caliber S&T Business Area



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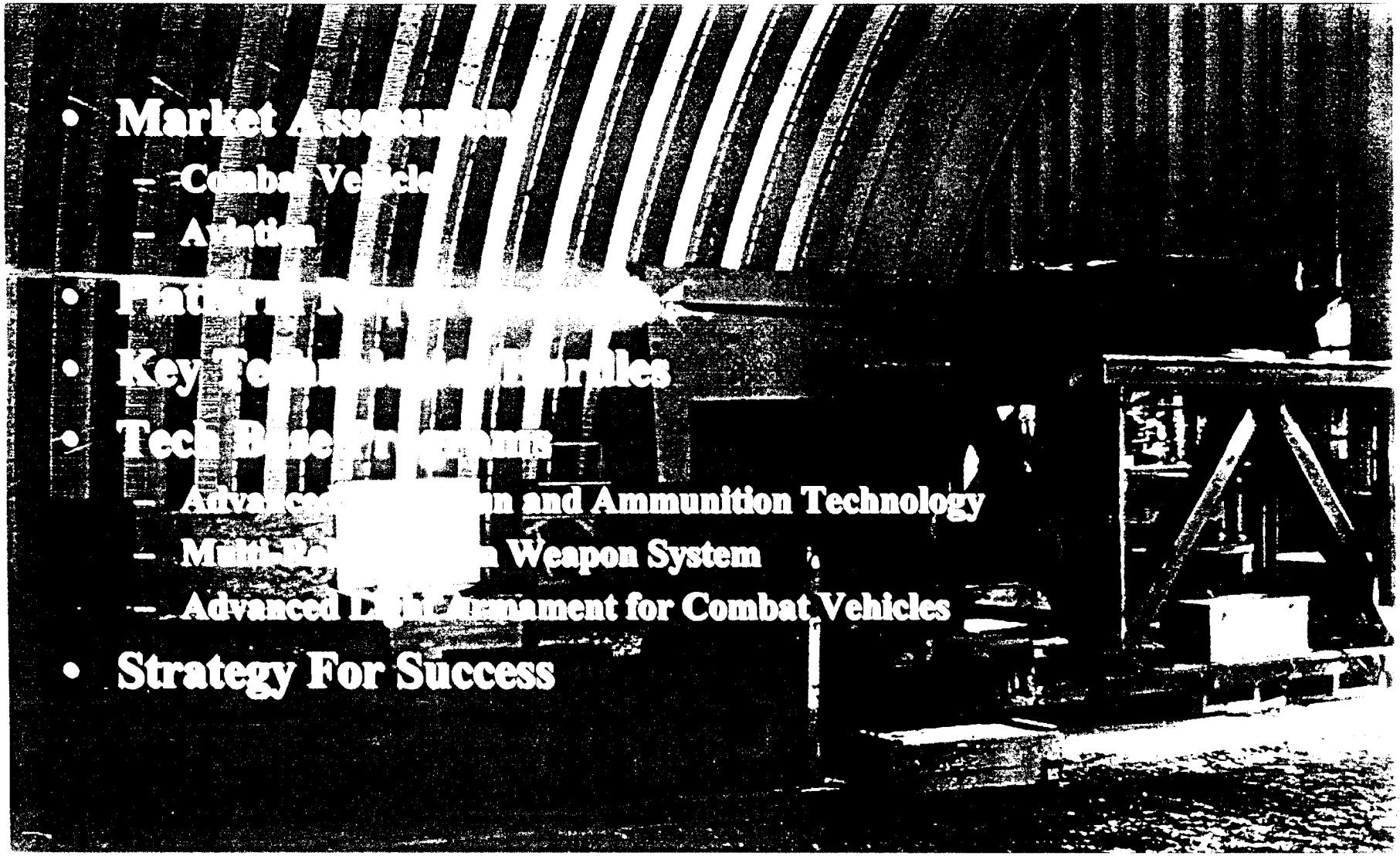
Outline



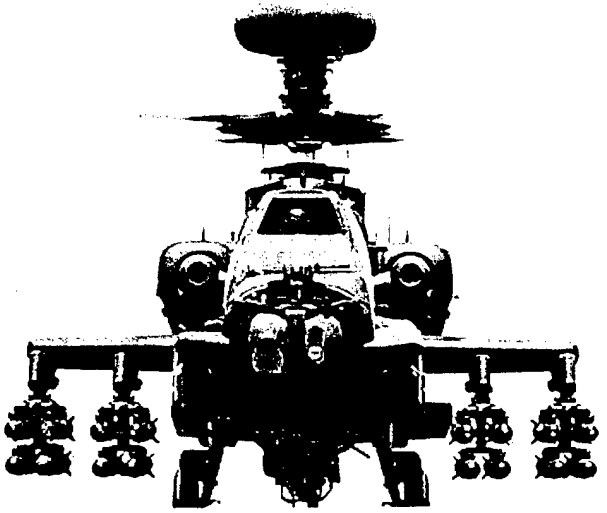
- Market Assessment
  - Combat Vehicle
  - Aviation
- Enabling Technologies
- Key Technology Thrusts
- Technology Investments
  - Advanced Gun and Ammunition Technology
  - Multi-Purpose Weapon System
  - Advanced Lightweight Armament for Combat Vehicles
- Strategy For Success

Market Assessment

- Combat Vehicles
  - USMC AAAV (Approx 1000 vehicles)
    - IOC FY06
  - Future Scout Cavalry System (Approx. 1600 vehicles)
    - ATD FY98-01
    - EMD FY02-06
  - Future Infantry Vehicle (Approx. 1600 vehicles)
    - EMD FY12
  - Bradley Upgun
    - No current plans.

Market Assessment

- Aviation Platforms
  - Longbow Apache Upgrade (Initially 382 vehicles)
    - EMD 02/Production 04
  - Comanche (Approx 1200 vehicles)
    - EMD 02-06



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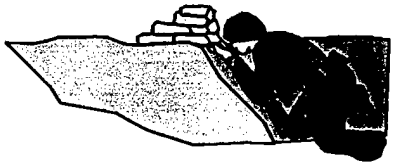
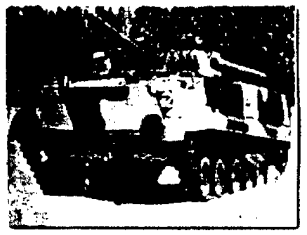
Customer Gun System Requirements

Combat Vehicles

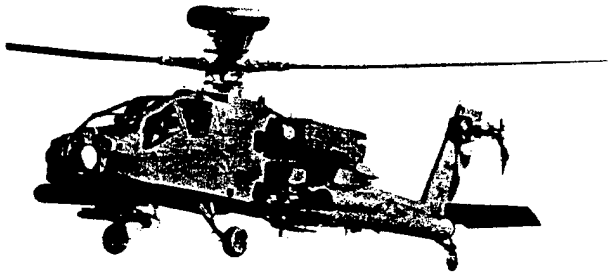
- Acquisition approach; "NDI"
- Anti-Personnel
  - Prone Defilade Troops
  - Foxholes
- ATGM Sites/Bunkers etc. Lt. Trucks
- IFV's
  - BMP 3 and beyond
- Self Air Defense





Customer Gun System Requirements

Aviation Platforms



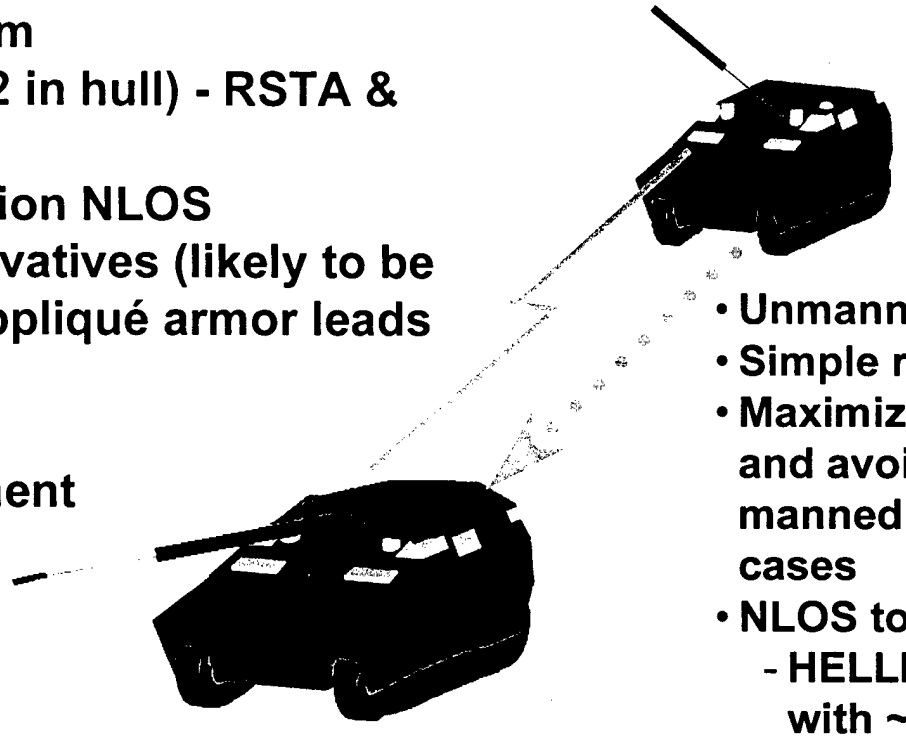
- System Accuracy
  - Reduced Ammunition Capacity
  - Air-To Air Capability (MNS)
- Improved Reliability
- Reduced O&S Costs
- EMI Sensitivity

30mm Ammunition Interests

- Multipurpose
- Product Improvement of PGU-13 (PBXN-5) and PGU-14 (Tungsten)
- Airburst Munitions
  - Completed Phase I study in March 98
- 40mm Super Shot Family of Ammunition

Fighting FCV Concept

- Fighting vehicle team
  - Manned (crew of 2 in hull) - RSTA & direct fire
  - Unmanned precision NLOS
- 22-27 ton FSCS derivatives (likely to be tracked … frontal appliqué armor leads to 27 tons)
- Low silhouette
- Signature management



Build on FSCS

- Unmanned 22 ton version
- Simple robotics (follower)
- Maximize missile payload and avoid firing signature for manned systems in most cases
- NLOS top attack CE missile:
  - HELLFIRE III dual mode with ~12km max range
- Fire on the move
- Response < 30sec.

- Manned 22-27T version
- Missile/gun combination, plus designator for NLOS:
  - 4-6 CKEM mini-LOSAT (use vs MBT only)
  - Fire on the move
  - Med cal (> =35mm) cannon (suppression & all other targets, incl aircraft)
  - Call for NLOS missile vs longer range, less threatening targets
  - Appliqué armor vs medium caliber threats (frontal arc)
  - APS vs CE, large KE and top attack

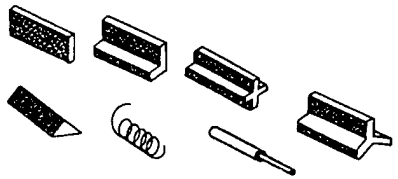
Future Secondary Armament

- Platforms with Interest
  - Crusader
  - FSCS
  - FIV
  - FCS
  - HMMWV
- Initial S&T Investment under MRAWS, focusing on System Concepting
  - Integration of OCSW and other Technologies
- Teamed with PM-Small Arms and FSAC

[redacted]

- Improve ATG effectiveness of 30mm M789 to offset planned 3X, stowed load reduction
- Demonstrate ATA capability in addition to ATG improvements
- Demonstrate potential of new bursting munition over current NDI solutions
- Development of system improvements required to fire Airburst Munitions
- Development of optimum long rods
- Validate NDI candidate cannon system performance

Advanced Light Gun and Ammo Technology (FY98)



KE Rods

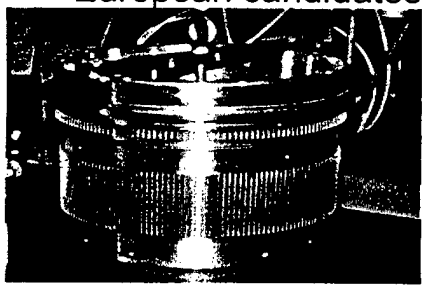
Materiel

Novel Penetrators

Bursting Munitions

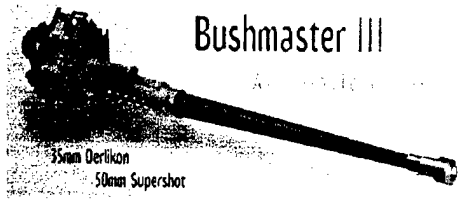
OCSW/OICW

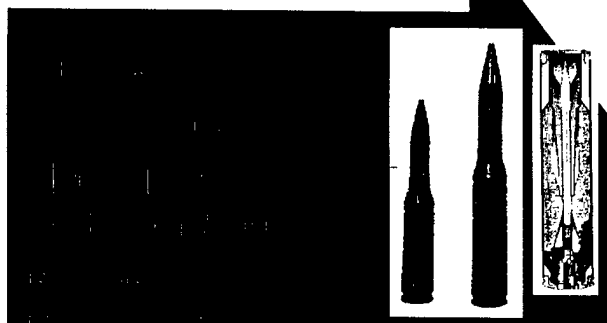
European candidates

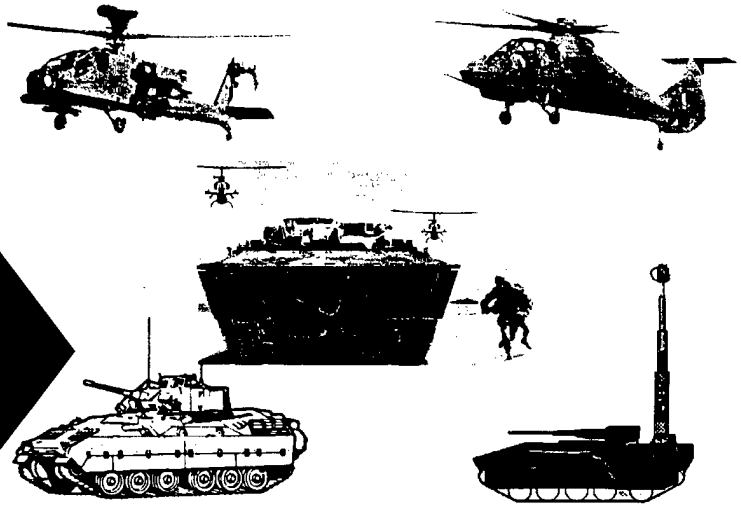


Gearless Turret Drives

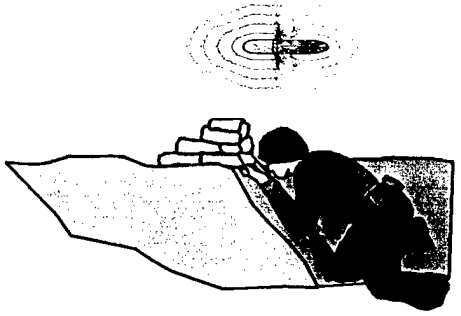
NDI Cannons







Providing Verified Weapon Concepts with Performance and Logistics Improvements



Leveraging on-going technologies for future platform needs

[redacted]

- **FY 97 Tasks:**
  - 25mm–45mm bursting munitions study /market survey
  - Supplemental penetrator terminal effects study (ARL).
  - Fire control error budget study (35-mm baseline gun).
  - Spin stabilized shape charge investigation (helicopter applications)
  - [illegible]
- **FY 98 Tasks:**
  - Fire control weapon stabilization definition (AH-64)
  - NDI 35mm Bursting Munition evaluation
  - 30mm Longbow ammunition concepting
  - [illegible]

Summary of Autocannon Candidates

- **25-mm M242**
  - In production for Bradley
  - AP performance maximized
  - HE growth: bursting munition
- **30-mm Bushmaster II**
  - FMS to Norway
  - GAU-type ammo
  - Selected for AAAV prototype
  - Growth to 40mm Supershot
- **35-mm Bushmaster III**
  - Prototype cannon
  - Gun fits Bradley A2
  - Good performance (current & projected threats)
  - Growth to 50-mm Supershot technology

40-mm CT-2000

1st gun prototype due Spr. 97

Gun /feeder fits Bradley A2

Mann Barrel demo Dec.97

40-mm Bofors L70/B

In production for CV90

Cumbersome (21-inch long) ammunition

Ammo performance only marginally better than 35 mm

45-mm CT-2000

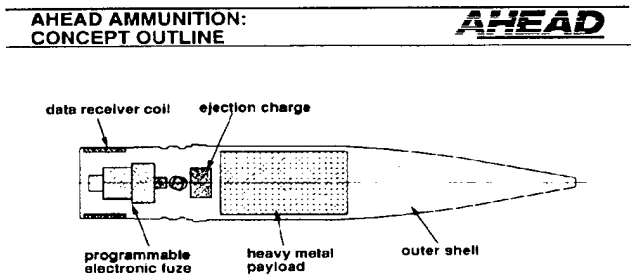
Prototype cannon

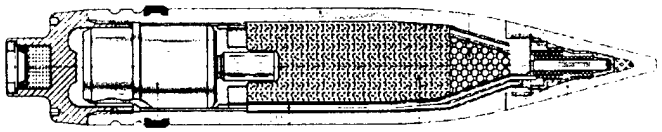
Significantly larger size

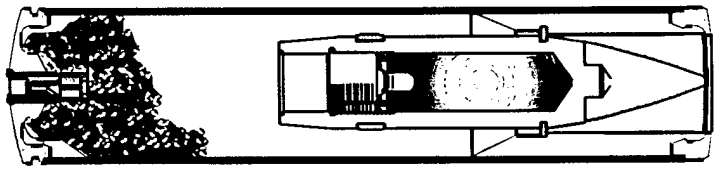
Cased Telescoped Ammo

Variable Timed Fuzing Technologies

- 20mm OICW / 25mm OCSW
  - Multi-functional (PD/Timed/Delayed PD)
  - Less aggressive launch environment
- 35mm AHEAD "Time Fuze"
  - In production for "Skyshield" air defense gun system
  - Inductively set @ muzzle
- 35mm German Time Fuze
  - Production ready
  - Inductively set at chamber
- 40–45mm CTAI Time Fuze
  - Developing optimized fragmentation warhead
- 40mm Bofors 3P
  - Proximity fuse



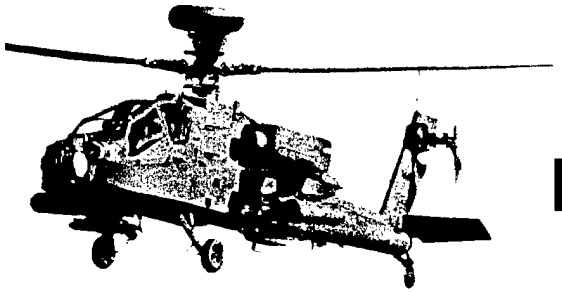




MultiRole Aviation Weapon System ARD-07

Improve M789

Spin Compensated Shape Charge Liner
Proximity/Bursting Fuze
Steel Case/Compacted Propellant



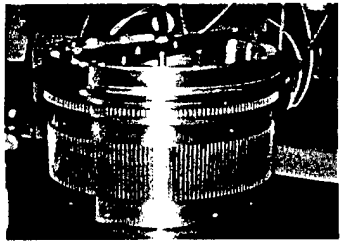
Air to Air

Light Armor

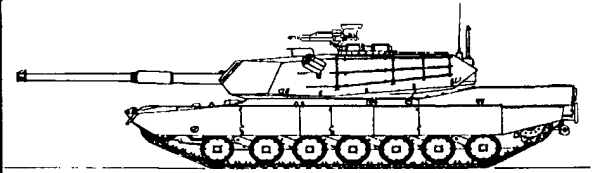
Antipersonnel

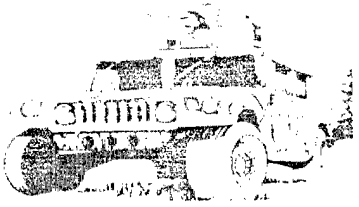
Composite Structure

Advanced Electric Drive

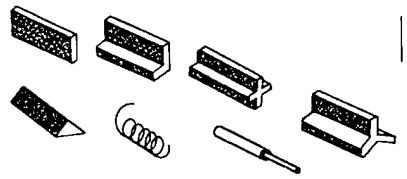


Precision Primary and Secondary Armament Applications





Advanced Light Armament for Combat Vehicles (FY01-03)

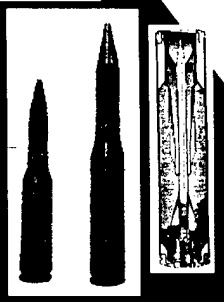


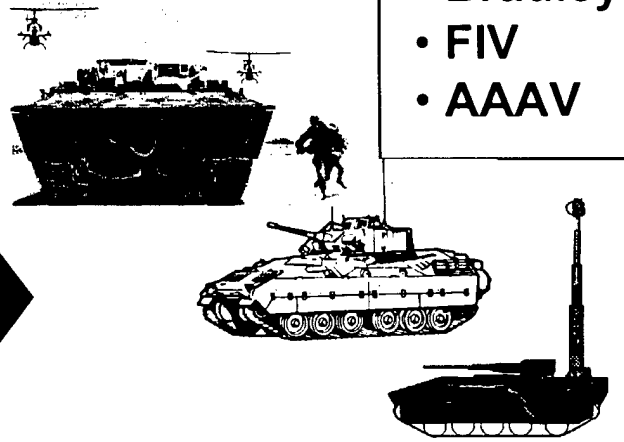
KE Rods
Materiel
Novel Penetrators

Bursting Munitions

OCSW/OICW
European candidates

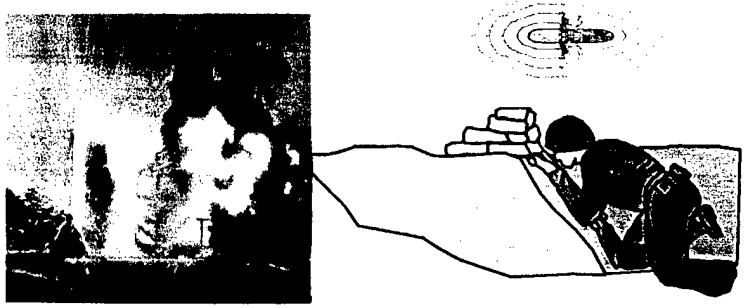
Goals:
Demonstrate enhanced anti-armor/personnel effects to meet multiple User lethality requirements





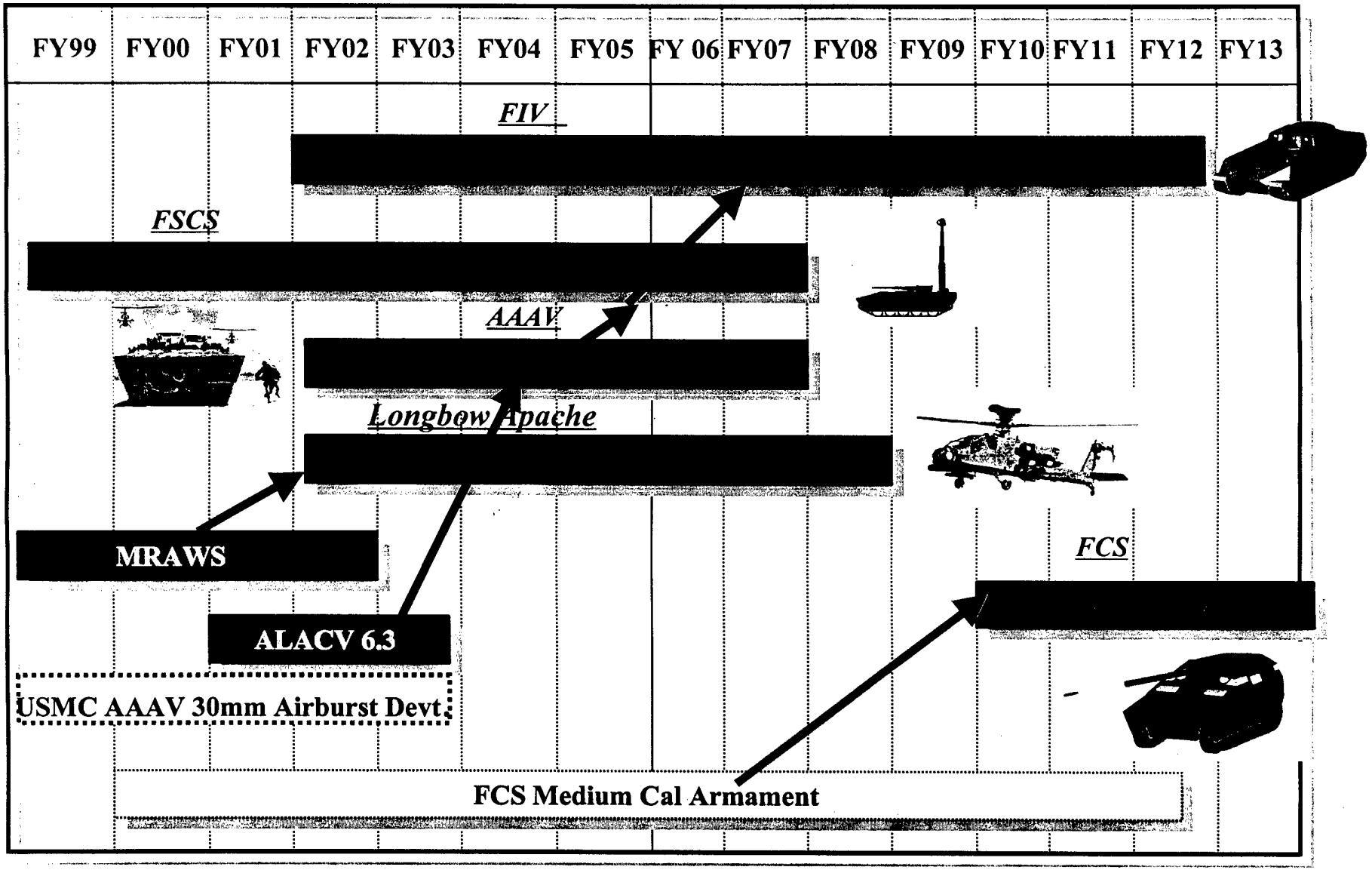
- FSCS
- Bradley
- FIV
- AAAV

Providing Enhanced Anti-Armor/Personnel Effects for Ground Combat Vehicles



Leveraging on-going technologies for future combat vehicle needs

S&T Transition Roadmap



Conclusions

- **Growing Business Area for *TACOM-ARDEC***
- S&T Interest *Finally* expressed in Medium Caliber S&T
  - Advance Light Gun and Ammo Technology (FY98)
  - Multi-Role Aviation Weapon System (FY99-02)
  - Advanced Light Armament for Combat Vehicle (FY01-03)
- Programs budgeted and supported for the following interests:
  - Longbow Apache
  - Ammunition for Future Combat Vehicles (FSCS, FIV, AAAV)
  - Secondary Armament for both air and ground platforms
- PM Support *(Both moral and financial)*
- Joint program *opportunity* exists with USMC, AAAV
- New Interest in Medium Cal solution for FCS, per Dr. Milton